



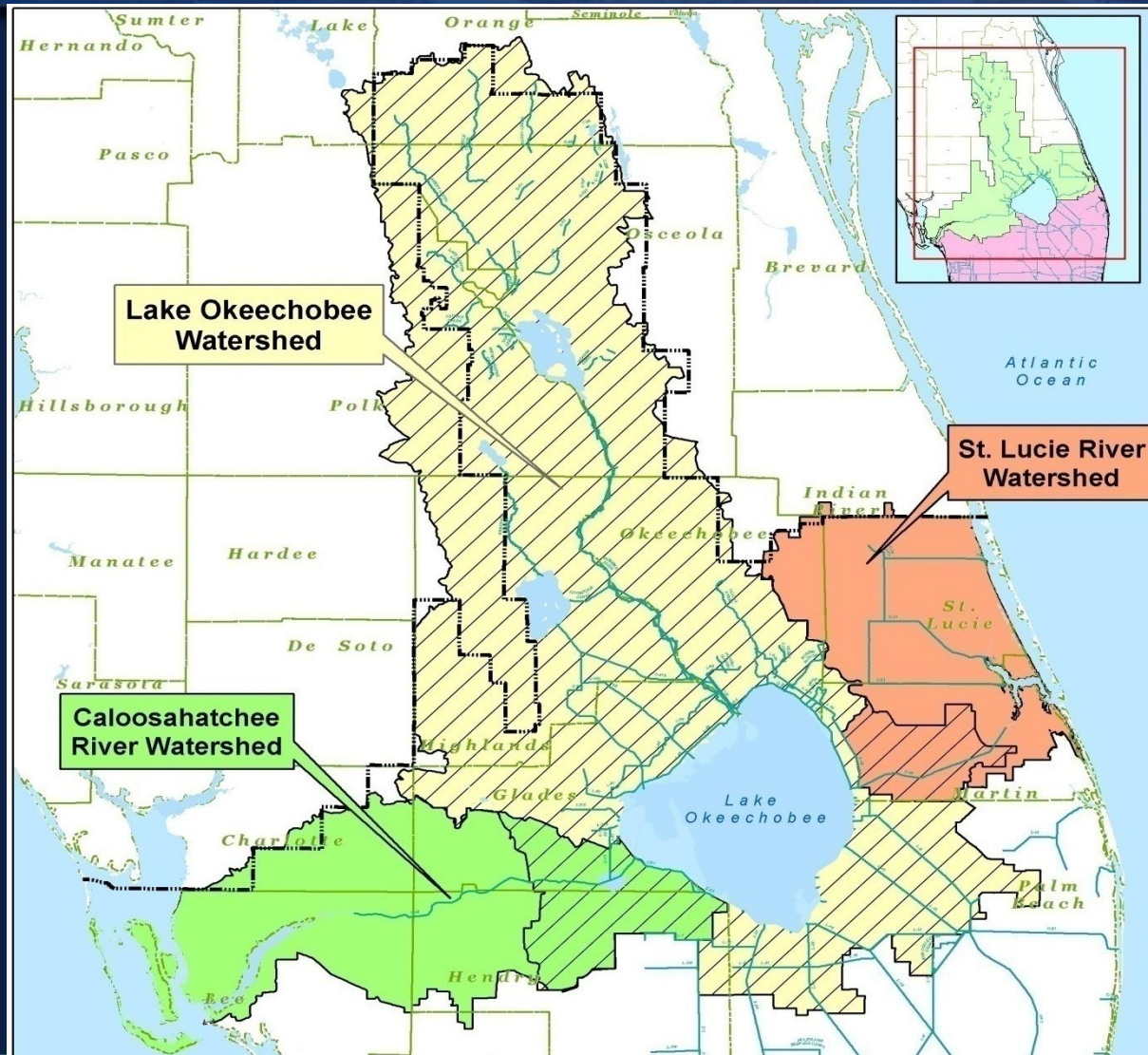
Northern Everglades and Estuaries Protection Program Update

WRAC Lake Okeechobee Committee Meeting- 09/30/09

**Pinar Balci, Ph.D – Northern Everglades Technical Program
Specialist**



The Northern Everglades





Lake Okeechobee Protection Plan Update



I. Pollutant Control Program

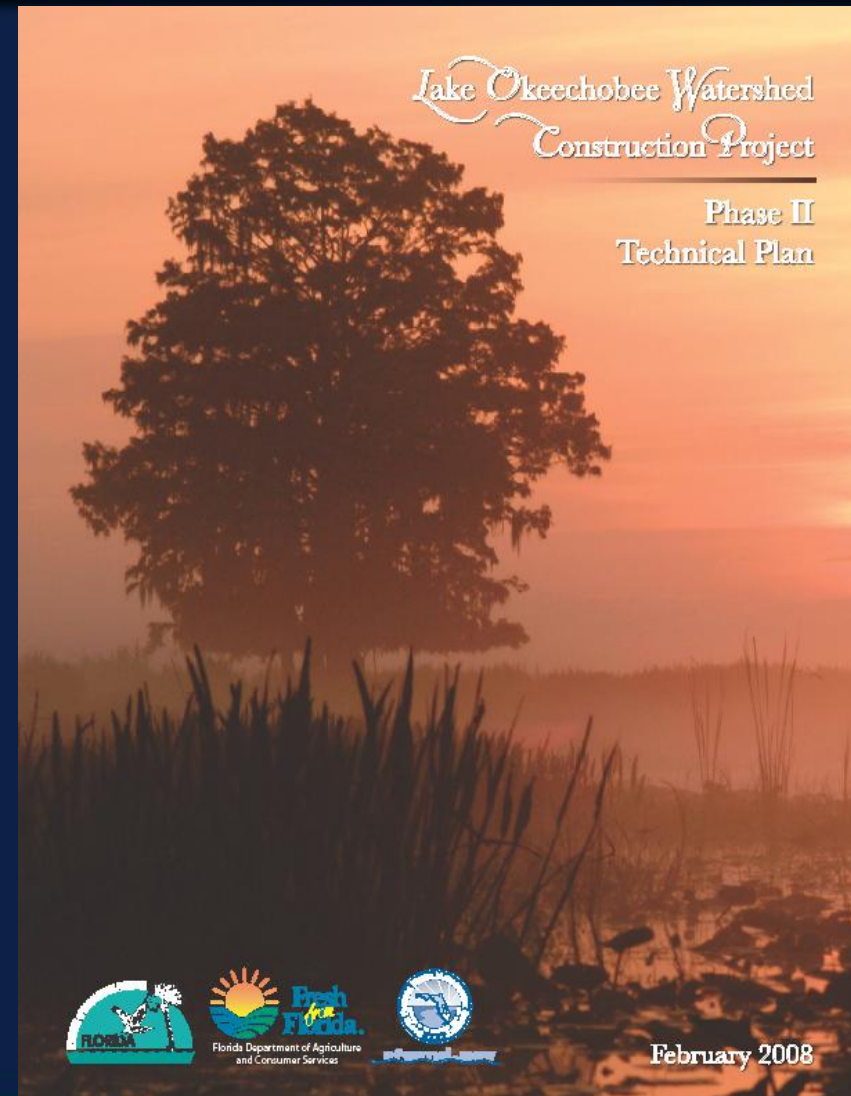
II. Construction Project

III. Research and Water Quality Monitoring Program



Lake Okeechobee Phase II Technical Plan

- Delivered to Legislature on February 1, 2008
- No action was taken during session- therefore plan is deemed approved and may be implemented
- Plan implementation (Process Development & Engineering) is moving forward
- Three- year Plan update due in early 2011





Pollutant Control Program

- **Implementation of agricultural and urban BMPs**
- **Revisions to regulatory programs**
 - **Environmental Resource Permit (ERP) Program**
 - **Statewide Stormwater Rule- Water Quality (FDEP)**
 - **Northern Everglades ERP Basin Rule- Water Quantity (SFWMD)**
 - **District's Source Control Program Regulatory Rule (Chapter 40E-61)**
 - **Works of the District Regulatory Phosphorus Source Control Program**



Pollutant Control Program

SFWMD Phosphorus Control Program

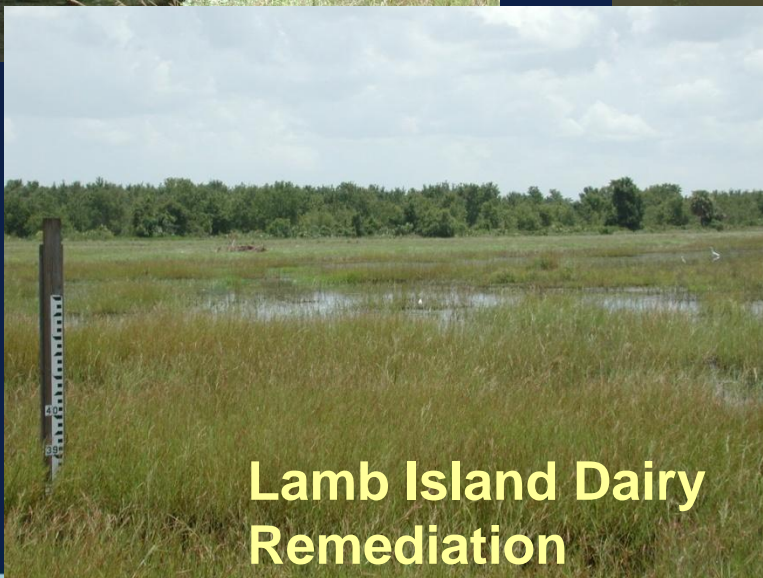
Eckerd Youth Center



Lemkin Creek Wetland Restoration



Lamb Island Dairy Remediation





Construction Project

Lake Side Ranch STA

- Project is designed in two phases:
 - *Phase 1:* STA- North, S-650 pump station and canal improvements
 - *Phase 2:* STA-South and S-191A pump station
- Phase I construction is underway
- Phase II design is underway; construction is contingent on additional funding





Construction Project

Fisheating Creek Feasibility Study

- **Fisheating Creek- selected due to challenges associated with this portion of the Lake Okeechobee watershed**
- **Objective:**
 - **Improve hydrology and water quality through storage and treatment features**
- **Feasibility Study has two-phases:**
 - **Phase I: Included investigation of available information and work plan development-completed in March 2009**



Construction Project

Fisheating Creek Feasibility Study (Con't)

- Phase II: Includes alternative formulation, evaluation and selection; compilation of results and write-up of the report- kicked off in May 2009
- Current activities:
 - Refinement of Phase II Technical Plan targets for storage and water quality
 - Modeling:
 - Refining WAM simulations for pre-drainage and existing
 - Outreach program development
 - Greater landowner participation





Construction Project

Chemical Treatment Study

- Designed to investigate available information on chemical treatment technologies that have been tested to reduce TP loads in stormwater runoff and identify technologies appropriate for use in the Northern Everglades
- Phase I: Literature review was completed in July 2009
 - Summarizes latest information on chemical treatment methods and potential Northern Everglades applications
- Phase II: Site identification and potential implementation



Construction Project

Hybrid Wetland Treatment Technology

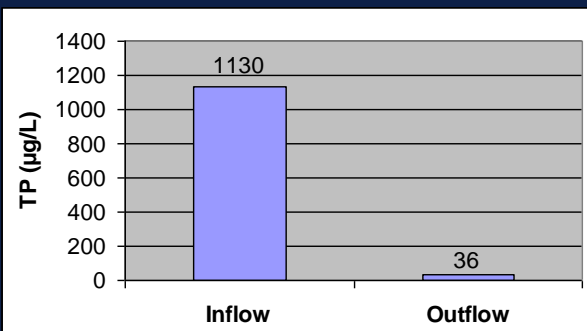
- Original four sites (Nubbin Slough, Mosquito Creek, Larson 8, and Ideal Grove) continue operation and optimization activities while providing phosphorus concentration reductions ranging from 60 – 90%.
- Cost effectiveness and P load reduction information will be provided in the Year 2 final report due in November.
- FY09 sites constructed at Lemkin Creek (Wolff Ditch and FDOT Ditch) are substantially complete and treating base flows of 4 cfs.
- FY10 funding will be used for continued operation of the existing 6 sites and construction of up to 2 new sites.



Construction Project

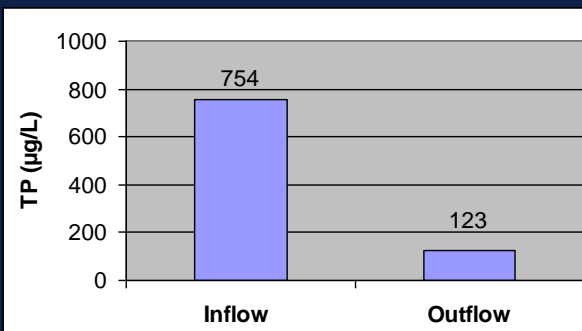
Hybrid Wetland Treatment Technology (Con't)

Mosquito Creek



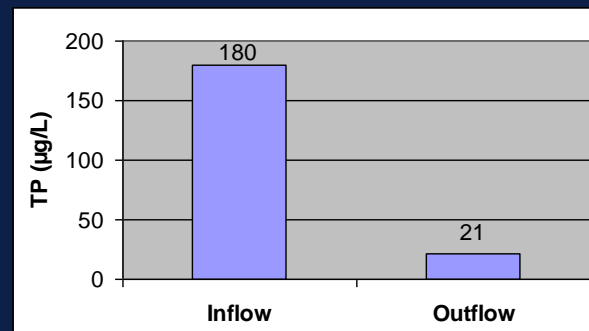
Mean P removal performance,
Feb – July 2008

Nubbin Slough



Mean P removal performance,
Feb – July 2008

Ideal 2 Grove



Mean P removal performance,
March – July 2008



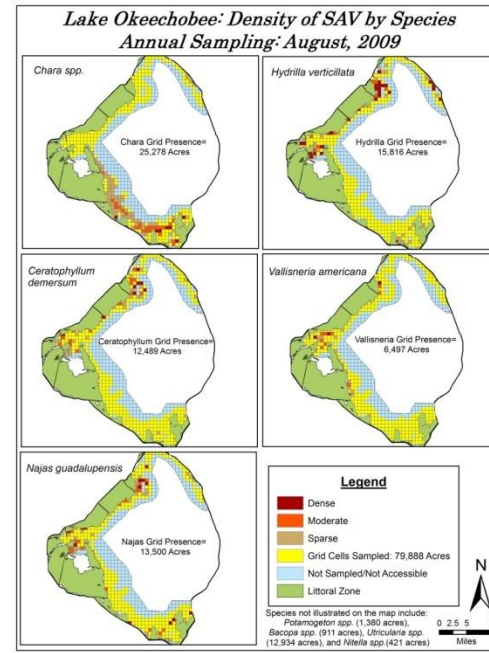
Dispersed Storage and Treatment

- **Originated as Lake Okeechobee and Estuary Recovery Initiative in 2005**
 - **Included as management measures in LO Phase II Technical Plan and River Watershed Protection Plans**
- **Primary goals: water retention, load reduction and/or hydrologic restoration**
- **Dispersed Storage and Treatment Program development is underway**
 - **Address outstanding items (technical, legal, permitting, etc.)**
 - **Establish process for solicitation, evaluation and selection of projects**



Research and Water Quality Monitoring Projects

- Lake Okeechobee in-Lake Assessment Projects
 - Submerged Aquatic Vegetation
 - Algal Bloom and Toxin
 - Routine Plankton Monitoring
 - Periphyton Research
 - Native Plant Re-vegetation
 - Ecological Data Management System





Research and Water Quality Monitoring Projects

- Sub-basin Monitoring Network (USGS)
- Exotics and Nuisance Species Control
- LO Water Quality Model
- LO Environment Model

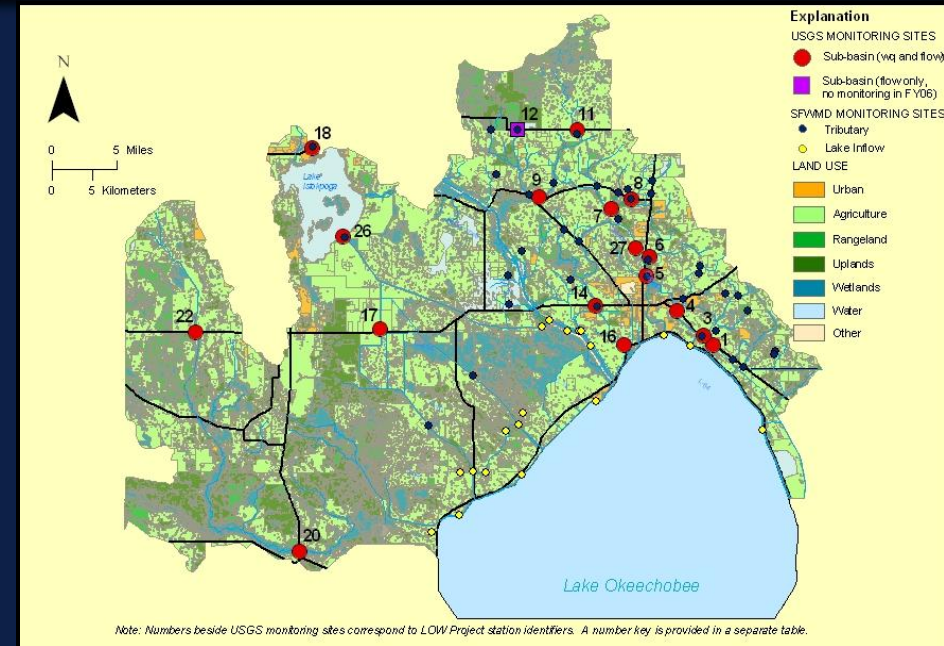
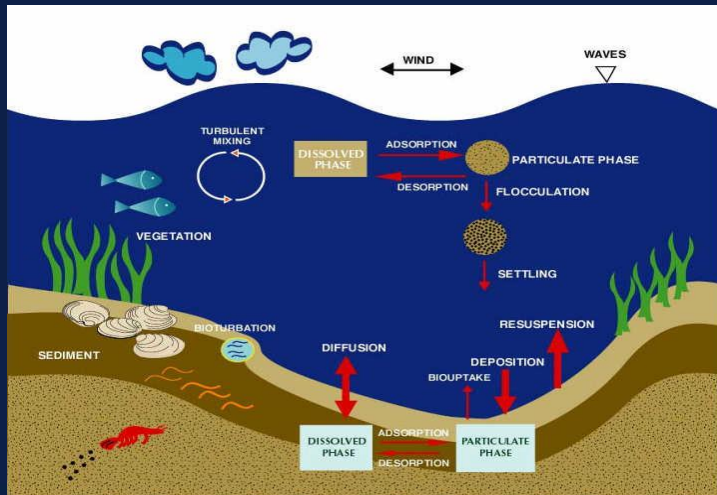


Figure 1. USGS sub-basin monitoring stations in the Lake Okeechobee watershed.





Caloosahatchee and St. Lucie River Watershed Protection Plans Update

- I. Pollutant Control Program**
- II. Construction Project**
- III. Research and Water Quality Monitoring Program**



River Watershed Protection Plans

- Final Plans submitted to the Legislature on Jan 1, 2009
- Legislature took no action on the plans during the 2009 legislative session, hence the plans are deemed approved and may be implemented
- RWPPs will provide the basis for FDEP's BMAP development



*Caloosabatchee River
Watershed Protection Plan*



*St. Lucie River
Watershed Protection Plan*



January 2009



Pollutant Control Program

- **Implementation of agricultural and urban BMPs**
- **Revisions to regulatory programs**
 - **Environmental Resource Permit (ERP) Program**
 - **Statewide Stormwater Rule- Water Quality (FDEP)**
 - **Northern Everglades ERP Basin Rule- Water Quantity (SFWMD)**
- **District's Source Control Program Regulatory Rule (Chapter 40E-61)**
 - **Establishment of River Watershed Nutrient Source Control Programs**



Pollutant Control Program

- **Nutrient Source Control Programs- include following phases:**
 - Water quality monitoring
 - Data management and assessment
 - BMP effectiveness performance measure development
 - Rule making and adoption
 - Rule implementation
- **The first four phases are expected to be completed by the end of FY2012, followed by rule implementation**
 - Multiple tasks requiring staff resources as well as funding in future fiscal years in order to progress into the implementation phase



Construction Project

C-43 Water Quality Treatment and Testing Facility

- Objective: Develop, design and build a testing facility to provide total nitrogen treatment
- Several major tasks completed:
 - Cultural resources assessment survey; Phase I/II Environmental site assessments; Total nitrogen reduction technologies review; Topographic survey
- Others underway:
 - C- 43 water quality project plan development and design
- Next Step: Complete design of test cells





Construction Project

Spanish Creek/Four Corners

- The Spanish Creek Four Corners Project is a management measure of the Caloosahatchee River Watershed Protection Plan.
- The overall goal of this multi-phase restoration project is to provide flow-way restoration, water quality improvement, and aquifer recharge.
- Implementation of the larger restoration project is based on future funding opportunities.



**County Line
Ditch/Four Corners
Phase I**

**CANAL CLEANING BY
HENDRY COUNTY**

**TORTOISE
RELOCATION**





Construction Project

County Line Ditch/Four Corners Phase I

- **Completed several major tasks under Phase I:**
 - Installation of monitoring wells and staff gages
 - County Line Ditch Clearance south of CR-78 and associated gopher tortoise relocation
 - Topographic surveys to obtain cross sections of County Line ditch and associated infrastructure
- **On- going efforts:**
 - Gathering data from monitoring wells
- **Next Steps:**
 - Modeling of alternatives with the new survey data
 - Compare alternatives to improve the capacity of CLD to meet appropriate drainage goals
 - Future phases dependant on Legislature funding



Construction Project

Powell Creek Algal Turf Scrubber

- Pilot construction completed and operation began in October 08
- Data collection underway
 - Pilot unit is growing algae and generally working as expected
- Next steps- Completion of monitoring and final report by January 2010





Construction Project

5/5/5 projects with Martin County

- **Manatee Pocket Dredging:** Removal of accumulated muck for water quality and habitat improvement
 - Permits obtained; Gopher tortoise relocation completed
 - Contractor is secured for construction; Mobilization is expected to start in fall 2009.
- **Manatee Creek Basin Water Quality Retrofit:** Provides treatment of uncontrolled discharges to the Manatee Pocket from the Manatee Creek
 - Survey and redesign is complete.
 - Permits mostly completed.
 - Phase II land acquisition complete; Phase III project layout configured and all essential parcels obtained



Construction Project

5/5/5 projects with Martin County (Con't)

- **North River Shores Vacuum Sewer System-** Enhances water quality in the North Fork of the St. Lucie River by eliminating nutrient loading from septic systems
 - Permits and construction plans are complete
 - Project bid pricing request is sent out to vendors
 - Martin County staff plans on taking a final Assessment Resolution to the BOCC in October and construction will start shortly after.
- **Old Palm City Phase III Water Quality Retrofit-** Improves water quality through developing a neighborhood stormwater quality management system
 - Land acquisition was completed in April 2009 with the closing on the final three lots.
 - Acquisition of an additional two lots to increase the storage capacity of the project is currently under way.



C-44 Project

- **Design completed; Land acquired**
- **USACE intends to construct C-44 Project in multiple contracts**
 - **Break apart existing plans and convert specifications to USACE format**
- **Contract 1**
 - **Construct Intake and C-132/C-133/C-133A Canals, Citrus Boulevard improvements, Bar B Ranch access, and Troup Indiantown Water Control District features**
 - **Construction start scheduled for September 2010 and last 2 years.**
- **Two additional contracts for Reservoir/Pump Station and STAs**
 - **All construction complete 2017**



Research and WQ Monitoring Program

Research Projects

Research Topics	Project	CRE	SLE
Nutrient Budget	Measurements of Primary Production in CRE and SLE (Contract)	✓	✓
	Groundwater Seepage Studies in SLE and CRE (Contracts) *	✓	✓
Dissolved Oxygen Dynamics	SLE DO Data Analyses (In-House)		✓
	CRE DO Data Collection (In-House)	✓	
Low Salinity Zone	CRE Oligohaline Zone Study (Contract)	✓	
Light Attenuation in San Carlos Bay	CRE Measurements of Colored Organic Matter (In-House)	✓	
Integrated Modeling	SLE Water Quality Model update (In-House)		✓
	SLE Opti6 Model Reconfiguration (In-House)		✓



Research and WQ Monitoring Program

Synoptic Flow and WQ Monitoring- CRW

- **Objectives:**
 - **Estimate the flow contribution from the tributaries, east of S-79, to the Caloosahatchee River's main stem, and, to validate the location of proposed long-term monitoring sites under CRWPP**
 - **Support source control program development for the freshwater portion of the watershed**
- **Wet season (May–September 2009) water quality and flow data collection**
- **Bi-weekly measurements at 16 sites**



Research and WQ Monitoring Program

Synoptic Flow and WQ Monitoring- CRW

- Flow Measurements conducted using the ADCP
 - Acoustic Doppler Current Profiler mounted on an un-manned tri-maran boat hull (Riverboat)
- The Marsh-McBirney meter was used in shallow and very low-flowing channels
- Water Quality- Grab samples



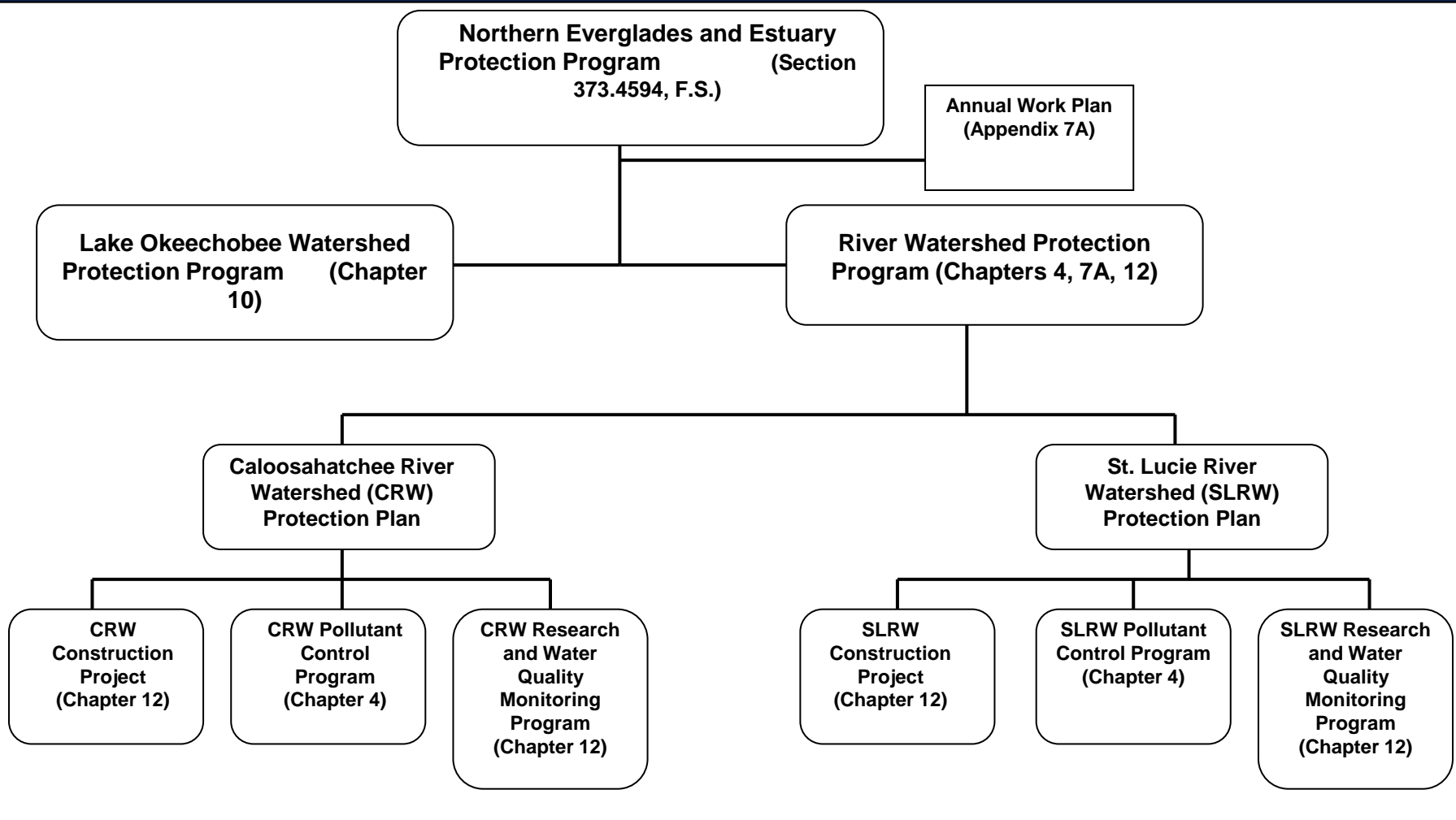


Annual Reporting

- **South Florida Environmental Report (SFER)**
 - **Status Updates of Projects**
 - Included in several chapters in SFER
 - Lake Okeechobee Watershed (Chapter 10)
 - Caloosahatchee and St. Lucie River Watersheds (Chapter 12)
 - NE Source Control Program (Chapter 4)
 - **Northern Everglades Annual Work Plan for FY2010 (Appendix 7A)**
 - Includes projects undertaken by coordinating agencies



Annual Reporting- SFER



<https://my.sfwmd.gov/northerneverglades>

Questions

